

## SCOPE OF CLAIM

1. A process of producing a polyester-based polymer, characterized by comprising continuously feeding a polymer (A) having hydroxyl groups and/or ester linkages and one or more species of cyclic esters (B) into a reactor comprising a column-type agitating mixer having two or more shafts of agitation and a static mixer connected to an outlet thereof and then subjecting them to ring opening polymerization, to obtain a copolymer (C).

2. A producing process according to claim 1, wherein the polymer (A) is a crystalline aromatic polyester.

3. A producing process according to claim 1 or 2, wherein the cyclic ester (B) is a lactone.

4. A producing process according to claim 3, wherein the lactone is  $\epsilon$ -caprolactone.

5. A producing process according to any of claims 1 to 4, wherein the conversion of reaction of the cyclic ester (B), is 75 mole % or less after passing through the column-type agitating mixer having two or more shafts of agitation and before passing through the static mixer, and it is 75 mole % or more after passing through the static mixer.

6. A process of continuously producing a polyester-based polymer, characterized by continuously feeding a polymer (A) having hydroxyl groups and/or ester linkages and one or more species of cyclic esters (B) into a continuous reactor having a static mixer

and then subjecting them to ring opening polymerization to obtain a copolymer (c) in which:

the continuous reactor at least comprises a static mixer (SM(i)) for use in an early stage of reaction and a static mixer (SM(e)) for use in a final stage of reaction, the static mixer (SM(e)) being connected to SM(i) in series and being a type different from that of SM(i);

the X (i:e) value is 4 or greater, the value being calculated by substituting the pressure loss ratios Zi of SM(i) and Ze of SM(e) and the inside diameters Di of SM(i) and De of SM(e) into Equation (1) below:

$$X(i:e) = (Zi \times De^4) / (Ze \times Di^4) \quad (1)$$

7. A continuously manufacturing process according to claim 6, wherein the X(i:e) is 10 or greater.

8. A continuously manufacturing process according to claim 6 or 7, wherein

the Y(i) value is from 200 to 2,000, the value being calculated by substituting the pressure loss ratio Z(i), the mixer length L(i) and the inside diameter D(i) of SM(i) into Equation (2) below:

$$Y(i) = Z(i) \times L(i) / D(i) \quad (2)$$

9. A continuously manufacturing process according to claim 8, wherein the Y(i) is from 500 to 1,000.

10. A continuously manufacturing process according to any of claims 6 to 9, wherein a static mixer (SM(m)) for use in the

intermediate stage of reaction is optionally placed, between the SM(i) and the SM(e).

11. A continuously manufacturing process according to any of claims 6 to 10, wherein one or more or all of the SM(i), the SM(m) placed as required, and the SM(e) comprise a plurality of static mixers.

12. A continuously manufacturing process according to any of claims 6 to 11, wherein

for static mixers [SM(r), (r = 1 to n)] to the total of n pieces, constituting the SM(i), the SM(m) optionally placed, and the SM(e), the total value of Y<sub>r</sub> calculated using Equation (2) [i.e.,  $\Sigma Y_r = \Sigma Z_r \times L_r/D_r$ , (the range of  $\Sigma$  being r = 1 to n)] is 5,000 or less.

13. A continuously manufacturing process according to any of claims 6 to 12, wherein the polymer (A) is a crystalline aromatic polyester.

14. A continuously manufacturing process according to any of claims 6 or 13, wherein the cyclic ester (B) is a lactone.

15. A continuously manufacturing process according to claim 14, wherein the lactone is  $\epsilon$ -caprolactone.